

Abstract Submitted
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Tunneling between Two Counterpropagating Quantum Hall Edge States through a Narrow Aperture in a Line Junction P. JIANG, C. CHIEN, W. KANG, University of Chicago, L.N. PFEIFFER, K.W. BALDWIN, K.W. WEST, Lucent Technologies — We report on the tunneling characteristics of a quantum Hall line junction with a small aperture in an otherwise thin, nearly ideal tunnel barrier (width = 8.8 nm). The conductance through this particular junction reduces to that of a single mode quantum point contact under magnetic field and we can discern the tunneling property of two strongly coupled quantum Hall droplets. Near filling factors $\nu = 2, 1$, and $2/3$, we detect a sharp resonance in the zero-bias conductance at low temperatures. For fractional fillings near $\nu = 1/2$ and $\nu = 1/3$, the zero-bias conductance is strongly suppressed, and the peak evolves into a sharp minimum. We interpret the observed zero-bias features in terms of models of tunneling proposed for a line junction in the integer[1] and the fractional[2] quantum Hall regimes.

[1] E. Kim and E. Fradkin, Phys. Rev. B **67**, 45317 (2003).

[2] E. Papa and A.H. MacDonald, Phys. Rev. Lett. **93**, 126801 (2004).

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